VSA MYP Mathematics Year 10 Topic Planner 2011/12

(Extended Maths Objectives **highlighted**) **Time for this unit**: 7 to 8 weeks (5 lessons per week. 50 mins/lesson)

Weeks	Topic: Functions	General Aims By the end of this unit students should be able to:	Specific VSA Learning Objectives By the end of this unit students should know/be able to:	Main Resource(s)
1 to 8	**Part 1 Quadratics & Cubics**	➢ Comfortably solve quadratic equations ➢ Understand that different methods of solving equation have their own merits ➢ **Build on knowledge of quadratics in order to appreciate higher order polynomials**	➢ Factorise quadratic expressions ➢ Solve quadratic equations of the form* $ax^2 + bx + c = 0$ by: - Factorisation - Graphical Methods - **Completing the square** - The Formula (*Note – it may be necessary to manipulate a given equation to fit this form) ➢ Solve "real-life" problems described by quadratic equations ➢ Appreciate the effect of the discriminant in determining if a quadratic has real roots ➢ Understand that parabolas have a line of symmetry x = -b/2a ➢ **Use the completing the square method to locate vertices of parabolas** ➢ Understand that some of the methods above can also be used to solve higher order polynomials ➢ **Factorise the sum and difference of two cubes** ➢ **Understand the general features of a cubic graph, and link this to information about the roots of a cubic** ➢ **Solve factorisable cubics using algebraic long division**	New Trend Mathematics 4B (Ch2, Ch4, **Ch6**) New Trend Mathematics (Teachers CD + DVD) **Support Resources** Various worksheets Mathletics
	Part 2 Transforming Functions	➢ Understand how to transform a shape according to given instructions ➢ Understand how to transform a curve algebraically	➢ Reflect a shape in a (horizontal or vertical) line ➢ **Reflect a shape in multiple lines** ➢ Appreciate the concept of line symmetry ➢ Rotate a shape about any point using angle and centre of rotation (and find centres of rotation) ➢ Appreciate the concept of rotational symmetry ➢ Translate a shape with the vector $\begin{pmatrix} a \\ b \end{pmatrix}$ ➢ Be able to tessellate a shape ➢ Stretch a shape horizontally or vertically ➢ Enlarge a shape by a given scale factor about a given centre of enlargement (and find centres of enlargement) ➢ Understand that the following represent transformations of the graph of y = f(x) * y = f(x±a) * y = f(x) ± a * y = af(x) * y = f(ax) * y = f(-x) * y = -f(x)	

<table>
<tr><td></td><td>Guiding Question</td><td>Main Areas of Interaction Focus</td><td>Learner Profile</td></tr>
<tr><td rowspan="5"></td><td rowspan="5">How do we use mathematics to create elegant and useful artifacts?</td><td>Human Ingenuity – From furniture to ornamental gardens to company logos, the world of design leans heavily on mathematical shapes – especially transformed ones, arranged into symmetric patterns. How does this all work, mathematically?</td><td>Inquirers – Students look for quadratic functions in the real world
Communicators – it’s one thing saying that a design looks mathematical, it’s another being able to describe, in technical language, what those mathematical features are.</td></tr>
<tr><td>Technology</td><td>Assessment</td></tr>
<tr><td>➢ Solving polynomials with a GDC
➢ Curve-fitting with Geogebra</td><td>Bench Design (Criteria A, C, D)
Design a Logo (Criteria A and C)</td></tr>
<tr><td>Embedded Enquiry</td><td>Cross-curricular Links</td></tr>
<tr><td>Activity: Using interactive technology (in Geogebra) to see effects of parameters on shapes of curves. Using sliders.</td><td>Parabolas in physics (eg parabolic mirrors, projectiles), engineering (eg tunnels). The Assessment also (informally) links to the Design Cycle.</td></tr>
<tr><td>ATL</td><td colspan="2">Information Literacy: Use various programmes to organize, present and analyse data.
Problem-solving & Thinking Skills: The student independently constructs a number of plans to tackle a problem, and identifies the most suitable plan.</td></tr>
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